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**PROJECT**  
**C**ontemporary  
**H**istorical  
**E**xamination of  
**C**urrent  
**O**perations  
**REPORT**

**OV-10 OPERATIONS  
IN SEAsia**

**15 September 1969**

**HQ PACAF  
Directorate, Tactical Evaluation  
CHECO Division**

**Prepared by:**  
Capt JOSEPH V. POTTER  
**Project CHECO 7th AF, DOAC**



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## PROJECT CHECO REPORTS

The counterinsurgency and unconventional warfare environment of Southeast Asia has resulted in the employment of USAF airpower to meet a multitude of requirements. The varied applications of airpower have involved the full spectrum of USAF aerospace vehicles, support equipment, and manpower. As a result, there has been an accumulation of operational data and experiences that, as a priority, must be collected, documented, and analyzed as to current and future impact upon USAF policies, concepts, and doctrine.

Fortunately, the value of collecting and documenting our SEA experiences was recognized at an early date. In 1962, Hq USAF directed CINCPACAF to establish an activity that would be primarily responsive to Air Staff requirements and direction, and would provide timely and analytical studies of USAF combat operations in SEA.

Project CHECO, an acronym for Contemporary Historical Examination of Current Operations, was established to meet this Air Staff requirement. Managed by Hq PACAF, with elements at Hq 7AF and 7AF/13AF, Project CHECO provides a scholarly, "on-going" historical examination, documentation, and reporting on USAF policies, concepts, and doctrine in PACOM. This CHECO report is part of the overall documentation and examination which is being accomplished. Along with the other CHECO publications, this is an authentic source for an assessment of the effectiveness of USAF airpower in PACOM.



MILTON B. ADAMS, Major General, USAF  
Chief of Staff

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FOR THE COMMANDER IN CHIEF

  
WARREN H. PETERSON, Colonel, USAF  
Chief, CHECO Division  
Directorate, Tactical Evaluation  
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### n. AFXDC

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- (2) AFXDOC . . . . . 1
- (3) AFXDOD . . . . . 1
- (4) AFXDOL . . . . . 1
- (5) AFXOP . . . . . 1
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- (7) AFXOSN . . . . . 1
- (8) AFXOSO . . . . . 1
- (9) AFXOSS . . . . . 1
- (10) AFXOSV . . . . . 1
- (11) AFXOTR . . . . . 1
- (12) AFXOTW . . . . . 1
- (13) AFXOTZ . . . . . 1
- (14) AFXOXY . . . . . 1
- (15) AFXPD . . . . . 6
- (a) AFXPPGS . . . . . 3

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## 3. MAJOR COMMANDS

### a. TAC

#### (1) HEADQUARTERS

(a) DO . . . . .	1
(b) DPL . . . . .	2
(c) DOCC . . . . .	1
(d) DORQ . . . . .	1
(e) DIO . . . . .	1

#### (2) AIR FORCES

(a) 12AF	
1. DORF . . . . .	1
2. DI . . . . .	1
(b) T9AF(DI) . . . . .	1
(c) USAFSOF(DO) . . . . .	1

#### (3) AIR DIVISIONS

(a) 831AD(DO) . . . . .	1
(b) 832AD(DO) . . . . .	2
(c) 833AD(DDO) . . . . .	1
(d) 835AD(DO) . . . . .	1
(e) 836AD(DO) . . . . .	2
(f) 838AD	
1. DO . . . . .	1
(g) 839AD(DO) . . . . .	2

#### (4) WINGS

(a) 1SOW(DO) . . . . .	1
(b) 4TFW(DO) . . . . .	1
(c) 23TFW(DOI) . . . . .	1
(d) 27TFW(DOP) . . . . .	1
(e) 33TFW(DOI) . . . . .	1
(f) 64TFW(DO) . . . . .	1
(g) 67TRW(C) . . . . .	1
(h) 75TRW(DO) . . . . .	1
(i) 316TAW(DOP) . . . . .	1
(j) 317TAW(EX) . . . . .	1
(k) 363TRW(DOC) . . . . .	1
(l) 464TAW(DO) . . . . .	1
(m) 474TFW(TFOX) . . . . .	1
(n) 479TFW(DOF) . . . . .	1
(o) 516TAW(DOPL) . . . . .	1
(p) 441OCCTW(DOTR) . . . . .	1
(q) 451OCCTW(DO16-I) . . . . .	1
(r) 4554CCTW(DOI) . . . . .	1

#### (5) TAC CENTERS, SCHOOLS

(a) USAFTAWC(DA) . . . . .	2
(b) USAFTARC(DID) . . . . .	2
(c) USAFTALC(DCRL) . . . . .	1
(d) USAFTFWC(CRCD) . . . . .	1
(e) USAFSOC(DO) . . . . .	1
(f) USAFAGOS(DAB-C) . . . . .	1

### b. SAC

#### (1) HEADQUARTERS

(a) DOPL . . . . .	1
(b) DPLF . . . . .	1
(c) DM . . . . .	1
(d) DI . . . . .	1
(e) OA . . . . .	1
(f) HI . . . . .	1

#### (2) AIR FORCES

(a) 2AF(DICS) . . . . .	1
(b) 8AF(C) . . . . .	1
(c) 15AF(DOA) . . . . .	1

#### (3) AIR DIVISIONS

(a) 3AD(DO) . . . . .	3
-----------------------	---

### c. MAC

#### (1) HEADQUARTERS

(a) MAOID . . . . .	1
(b) MAOCO . . . . .	1
(c) MAFOI . . . . .	1
(d) MACOA . . . . .	1

#### (2) AIR FORCES

(a) 21AF(OCXI) . . . . .	1
(b) 22AF(OCXI) . . . . .	1

#### (3) AIR DIVISIONS

(a) 322AD(DO) . . . . .	1
-------------------------	---

#### (4) WINGS

(a) 61MAWg	
1. OIN . . . . .	1
(b) 62MAWg(OCXP) . . . . .	1
(c) 436MAWg(OCXC) . . . . .	1

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(d) 437MAWg(OCXI) . . . . 2  
 (e) 438MAWg(OCXC) . . . . 1  
 (f) 445MAWg  
     1. OC . . . . . 1  
     2. WDO-PLI . . . . . 1

(5) MAC SERVICES  
     (a) AWS(AWXW) . . . . . 1  
     (b) ARRS(ARXLR) . . . . . 1  
     (c) ACGS(AGOV) . . . . . 1  
     (d) AAVS(AVODOD) . . . . . 1

## d. ADC

(1) HEADQUARTERS  
     (a) ADODC . . . . . 1  
     (b) ADOOP . . . . . 1  
     (c) ADLCC . . . . . 1

(2) AIR FORCES  
     (a) 1AF(DO) . . . . . 1  
     (b) 10AF  
         1. ODC . . . . . 1  
         2. PDP-P . . . . . 1  
     (c) AF ICELAND(FICAS) . . . 2

(3) AIR DIVISIONS  
     (a) 25AD(ODC) . . . . . 2  
     (b) 29AD(ODC) . . . . . 1  
     (c) 31AD(CCR) . . . . . 2  
     (d) 33AD(OIN) . . . . . 1  
     (e) 34AD(OIN) . . . . . 2  
     (f) 35AD(CCR) . . . . . 1  
     (g) 37AD(ODC) . . . . . 1

## e. ATC

(1) HEADQUARTERS  
     (a) ATXDC . . . . . 1

## f. AFLC

(1) HEADQUARTERS  
     (a) MCVSS . . . . . 1  
     (b) MCOO . . . . . 1

## g. AFSC

(1) HEADQUARTERS  
     (a) SCLAP . . . . . 3  
     (b) SCS-6 . . . . . 1  
     (c) SCGCH . . . . . 2  
     (d) SCTPL . . . . . 1  
     (e) ASD/ASJT . . . . . 1  
     (f) ESD/ESO . . . . . 1  
     (g) RADC/EMOEL . . . . . 2  
     (h) ADTC/ADGT . . . . . 1

## h. USAFSS

(1) HEADQUARTERS  
     (a) ODC . . . . . 1  
     (b) CHO . . . . . 1

(2) SUBORDINATE UNITS  
     (a) Eur Scty Rgn(OPD-P) . . . 1  
     (b) 6940 Scty Wg(OOD) . . . . 1

## i. AAC

(1) HEADQUARTERS  
     (a) ALDOC-A . . . . . 2

## j. USAFSO

(1) HEADQUARTERS  
     (a) COH . . . . . 1

## k.

## k. PACAF

### (1) HEADQUARTERS

(a) DP . . . . . 1  
 (b) DI . . . . . 1  
 (c) DPL . . . . . 4  
 (d) CSH . . . . . 1  
 (e) DOTECH . . . . . 5  
 (f) DE . . . . . 1  
 (g) DM . . . . . 1  
 (h) DOTECH . . . . . 1

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- (2) AIR FORCES
- (a) 5AF(DOPP) . . . . . 1
    - 1. Det 8, ASD(DOASD) . . . . . 1
  - (b) 7AF
    - 1. DO . . . . . 1
    - 2. DIXA . . . . . 1
    - 3. DPL . . . . . 1
    - 4. TACC . . . . . 1
    - 5. DOAC . . . . . 2
  - (c) 13AF
    - 1. CSH . . . . . 1
    - 2. DPL . . . . . 1
  - (d) 7AF/13AF(CHECO) . . . . . 1

- (3) AIR DIVISIONS
- (a) 313AD(DOI) . . . . . 1
  - (b) 314AD(DOP) . . . . . 2
  - (c) 327AD
    - 1. DO . . . . . 1
    - 2. DI . . . . . 1
  - (d) 834AD(DO) . . . . . 2

- (4) WINGS
- (a) 8TFW(DCOA) . . . . . 1
  - (b) 12TFW(DCOI) . . . . . 1
  - (c) 35TFW(DCOI) . . . . . 1
  - (d) 37TFW(DCOI) . . . . . 1
  - (e) 56SOW(DXI) . . . . . 1
  - (f) 347TFW(DCOOT) . . . . . 1
  - (g) 355TFW(DCOC) . . . . . 1
  - (h) 366TFW(DCO) . . . . . 1
  - (i) 388TFW(DCO) . . . . . 1
  - (j) 405FW(DCOA) . . . . . 1
  - (k) 432TRW(DCOI) . . . . . 1
  - (l) 460TRW(DCOI) . . . . . 1
  - (m) 475TFW(DCO) . . . . . 1
  - (n) 633SOW(DCOI) . . . . . 1
  - (o) 6400 Test Sq(A) . . . . . 1

- (5) OTHER UNITS
- (a) Task Force Alpha(DXI) . . . . . 1
  - (b) 504TASG(DO) . . . . . 1

- m. USAFE
- (1) HEADQUARTERS
    - (a) ODC/OA . . . . . 1
    - (b) ODC/OTA . . . . . 1
    - (c) OOT . . . . . 1
    - (d) XDC . . . . . 1

- (2) AIR FORCES
- (a) 3AF(ODC) . . . . . 2
  - (b) 16AF(ODC) . . . . . 2
  - (c) 17AF
    - 1. ODC . . . . . 1
    - 2. OID . . . . . 1

- (3) WINGS
- (a) 20TFW(CACC) . . . . . 1
  - (b) 36TFW(DCOID) . . . . . 1
  - (c) 50TFW(DCO) . . . . . 1
  - (d) 66TRW(DCOIN-T) . . . . . 1
  - (e) 81TFW(DCO) . . . . . 1
  - (f) 401TFW(DCOI) . . . . . 1
  - (g) 513TAW(OID) . . . . . 1
  - (h) 7101ABW(DCO-CP) . . . . . 1
  - (i) 7149TFW(DCOI) . . . . . 1

## 4. SEPARATE OPERATING AGENCIES

- a. ACIC(ACOMC) . . . . . 2
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- c. AFRES(AFRXPL) . . . . . 2
- d. USAFA
  - (1) CMT . . . . . 1
  - (2) DFH . . . . . 1
- e. AU
  - (1) ACSC-SA . . . . . 1
  - (2) AUL(SE)-69-108 . . . . . 2
  - (3) ASI(ASD-1) . . . . . 1
  - (4) ASI(ASHAF-A) . . . . . 2

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c.	COMUSKOREA. . . . .	1
d.	COMUSMACTHAI. . . . .	1
e.	COMUSMACV . . . . .	1
f.	COMUSTDC. . . . .	1
g.	USCINCEUR . . . . .	1
h.	USCINCSO. . . . .	1
i.	CINCLANT. . . . .	1
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k.	COMMANDANT, MARINE CORPS. . . . .	1
l.	CINCONAD. . . . .	1
m.	DEPARTMENT OF THE ARMY. . . . .	1
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o.	JSTPS . . . . .	1
p.	SECRETARY OF DEFENSE (OASD/SA). . . . .	1
q.	USCINCMFAFSA. . . . .	1
r.	CINCSTRIKE. . . . .	1
s.	CINCAL. . . . .	1
t.	MAAG-China/AF Section (MGAF-0). . . . .	1

## 6. SCHOOLS

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j.	Senior USAF Rep, US Army JFK Center for Special Warfare . . . . .	1
k.	Senior USAF Representative, US Army Field Artillery School. . . . .	1



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**SECRET**

## FOREWORD

This CHECO report relates the methods employed in introducing the OV-10 aircraft into the Southeast Asia combat functions. The evaluation process of an unbiased COMBAT BRONCO team proved the superiority of OV-10 aircraft operating as a FAC vehicle. The OV-10 unit's organization, deployment, manning, and crew training in their relationship to the Tactical Air Control System are also reviewed. The final chapter outlines the advantages and disadvantages of the OV-10 and presents recommendations which might improve its effectiveness.

[REDACTED]

## CHAPTER I

### INITIAL USAF DEPLOYMENT-EVALUATION OF THE OV-10 IN SEA

In July 1968, six OV-10 aircraft were deployed to SEA accompanied by a task force of maintenance and operations personnel under the code name COMBAT BRONCO (CB). Its mission was to document and to provide data for evaluating the capability of the OV-10 aircraft to perform various functions of a Forward Air Controller (FAC) aircraft in support of U.S. ground forces in RVN.<sup>1/</sup> COMBAT BRONCO was unique in that a majority of the maintenance and operations evaluation personnel would remain in-theatre upon completion of the evaluation. Thus, the CB team introduced the OV-10 aircraft into the combat inventory,<sup>2/</sup> while simultaneously tasked with maintenance, operations, and evaluation. While accomplishing this mission, it was attached to the 19th Tactical Air Support Squadron (TASS), 504th Tactical Air Support Group (TASG) at Bien Hoa Air Base. The aircraft were integrated into the Southeast Asia FAC force under the operational control of III DASC.<sup>3/</sup>

The COMBAT BRONCO team was a composite of TDY and PCS (pipeline) personnel selected from TAC, 7AF, AFSC, and AFLC, by specialty, to perform operational, maintenance, evaluation, and support liaison tasks. To reduce bias to a minimum, BRONCO FACs with varied backgrounds were selected. Five FACs selected from 7AF had a combined total of more than 1,000 FAC missions in both O-1 and O-2 aircraft; all were Tet Offensive veterans. The five selected from CONUS resources included a combat experienced F-105 pilot, a T-28 veteran of out-country operations, an experienced A-1 instructor pilot, and two pilots



[REDACTED]

with no FAC experience.<sup>4/</sup>

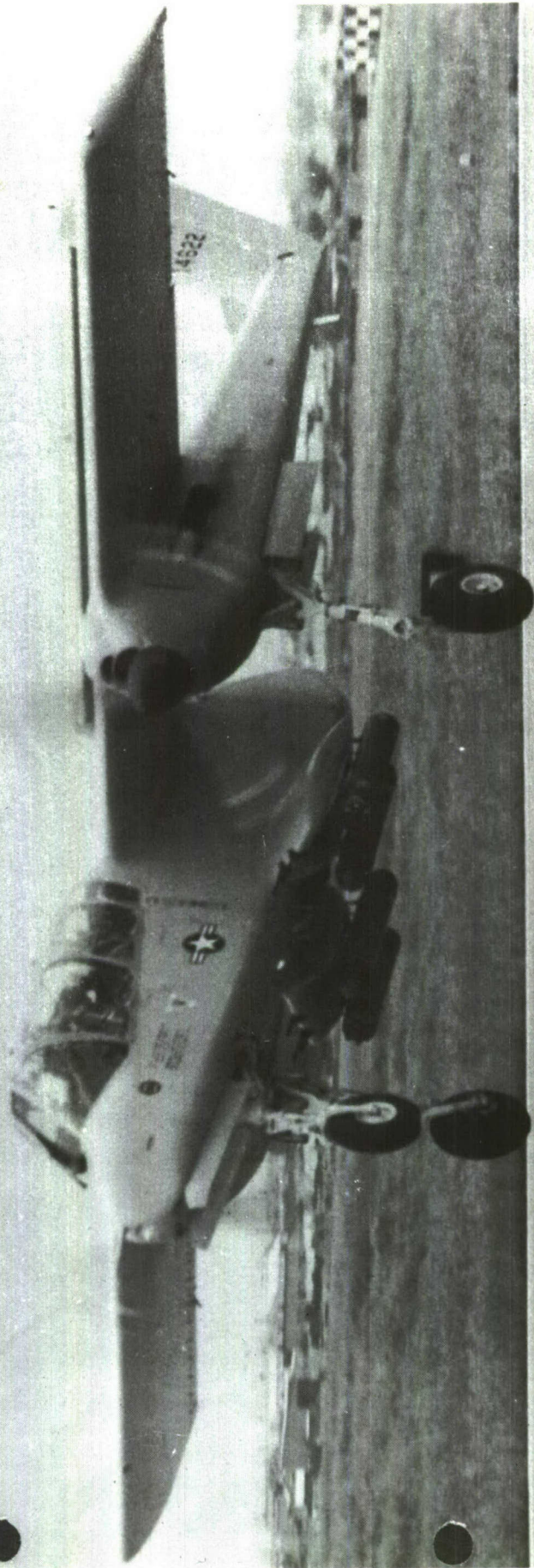
The five team members with no previous SEA-FAC experience attended Phase I ground training at the Theater Indoctrination School (TIS) at Phan Rang AB. Phase II ground training requirements were accomplished IAW 504th TASGR51-3 at Bien Hoa Air Base. This regulation covered all ground and flying training requirements a pilot needed to accomplish prior to being certified combat ready as a FAC.<sup>5/</sup>

During the first 15 days of the evaluation, the aircraft flew from a Forward Operating Location (FOL) at Lai Khe. Using their own Tactical Air Control Party (TACP) to support the 1st Division's 3d Brigade, team pilots augmented the FACs already in place.<sup>6/</sup> The team then became attached to the 19th Tactical Air Support Squadron (TASS) at Bien Hoa Air Base and augmented support for several divisions. Members continued to evaluate the ability of the OV-10 to operate from FOLs with minimum runway lengths, marginal ground operating conditions, and under austere maintenance conditions. Sorties were scheduled from five different FOLs within the III Corps Tactical Zone (CTZ).<sup>7/</sup>

Aircraft were scheduled daily for 12 hours of airborne coverage and placed on alert at night. Their missions included the entire spectrum of FAC roles: day and night airstrike control, gunship control, bomb damage assessment, visual reconnaissance (VR), artillery adjustment, and RANCH HAND escort. Five hundred and fifty-two FAC and VR sorties and more than one thousand combat hours were flown.<sup>8/</sup>



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OV-10 BRONCO  
FIGURE 1

UNCLASSIFIED



[REDACTED]

Without exception, the CB pilots rated maneuverability, response, visibility, and other capabilities of the OV-10s as either outstanding or excellent.<sup>9/</sup> Some significant incidents underscored these opinions.

COMBAT BRONCO recorded the first instance of the FAC aircraft providing its own flare illumination for subsequent target acquisition and control of fighter aircraft during a night attack:<sup>10/</sup>

*"The initial flare was dropped on a TACAN radial and a DME fix which corresponded to the target coordinates. The first flare was approximately 500 meters to the right of the target. The target was lighted and easily identifiable. The same flare was used to rendezvous the fighters. SNORT 07 dropped 6 more flares to help orient the fighters and SNORT 03 as he briefed on the airstrike. SNORT 03 then took over and provided his own illumination and directed the airstrike."*

On one particular mission the OV-10 demonstrated its flexibility for covert tactics:<sup>11/</sup>

*"FAC and fighter rendezvous were accomplished at high altitude away from the target. The FAC was at 10,000 feet and the fighters at optimum roll-in altitude for ordnance delivery. The fighters then followed the FAC to the target, striving to have one in a position to launch the attack with minimum delay. Upon initial entry into the target area, the FAC acquired the target and immediately began his marking run on the same heading pre-briefed for fighter attack. The marking rocket was fired at 5,000 feet AGL and before rocket impact, the FAC completed a 180-degree climbing turn. Upon roll-out, the FAC observed the marking smoke and issued any necessary corrections while visually acquiring the first fighter who was already in his run. Twenty seconds after marking rocket impact, heavy ordnance was on target."*



[REDACTED]

The BRONCO FACs also utilized the internal smoke generating capability of the OV-10 as an aid to rendezvous.<sup>12/</sup> In four specific instances under conditions of reduced visibility, the smoke was seen by the strike aircrews before the aircraft were detected.<sup>13/</sup>

One distinct advantage of the OV-10 was its maneuverability and evasive action capability when receiving ground fire. Though the O-1 could make tighter turns, it really only changed direction without making a great deal of progress over the ground. The OV-10 had a much greater zoom capability and could "jink" while gaining altitude.<sup>14/</sup>

In summary, these were the advantages of the OV-10 over the O-1 and O-2:<sup>15/</sup>

- . Two engines (improved single engine capability over the O-2).
- . Better visibility.
- . Four LAU-59 (7 rockets each) or four B-37K racks with 8 MK-24 flares or a combination of each.
- . Faster point to point, no time waste, cruise 150-180 knots, dive at 400 knots.
- . Greater zoom capability after marking.
- . Night and all-weather instrumentation.

As to disadvantages, the COMBAT BRONCO FACs could list few. The CB exercise was limited in scope and therefore did not allow full evaluation of the OV-10 capabilities, e.g., night operational capabilities. The largest disadvantage that they encountered, however, was aircrew discomfort, due to inadequate cockpit ventilation and the aircraft's greenhouse-like canopy.

[REDACTED]

Disadvantages of the OV-10 aircraft will be discussed in detail in the last chapter.

These statistics provide configurations over a wide range of rocket, flare, and fuel tank combinations which were evaluated:

<u>Configuration</u>	<u>Gross Weight</u>	<u>FAC Sorties</u>	<u>VR Sorties</u>
Clean	10,040	0	9
2/LAU-59 (14 RKTS)	10,572	9	39
4/LAU-59 (14 RKTS)	10,672	53	205
2/LAU-59 (14 RKTS) and 1/B-37K	10,827	0	12
3/LAU-59 (14 RKTS) and 1/B-37K	10,877	37	59
2/LAU-59 (14 RKTS) and 2/B-37K	10,987	21	52
2/LAU-59 (14 RKTS) and 2/B-37K (8 Flares)	11,187	6	10
3/LAU-59 (14 RKTS) and 1/B-37K (4 Flares)	10,977	6	7
2/LAU-59 (14 RKTS) and 1/AERO-1C	11,500	0	8
4/LAU-59 (14 RKTS) and 1/AERO-1C	11,848	0	5
2/LAU-59 (14 RKTS), 2B-37K (8 Flares) and 1/AERO-1C	12,034	<u>0</u> 132	<u>14</u> 420

Total Sorties Flown - 552

Of these 552 sorties, the M-60 machine guns were fired on only 9 sorties for test and evaluation purposes. Although guns were loaded with 1600-2000

[REDACTED]

rounds of ammunition, guns were not fired on any operational FAC mission.<sup>16/</sup>

In addition to its evaluation task, the CB team established the OV-10 flying training syllabus for the 504th TASG Theater Indoctrination School and checked out the first six newly assigned OV-10 pilots to SEA.<sup>17/</sup> So well did the CB evaluation proceed that it led quickly to the orderly introduction of the OV-10 aircraft into the Air Force combat inventory, the establishment of operational training and maintenance requirements, and the testing of special equipment in the different FAC roles.



**COMBAT BRONCO**  
**SORTIES FLOWN BY MISSION TYPE**

DATE	OTHER	TRAINING	FCF	VR DAY	VR NIGHT	FAC DAY	FAC NIGHT	RANCH HAND FAC	SLEEPY TIME	PEPPER BASKET DAY	PEPPER BASKET NIGHT	WEEKLY TOTAL
AUG 10-16	0	11	4			2						17
AUG 17-23	2	18	4	1		7						32
AUG 24-30	0	10	10	2		9						31
AUG 31-SEP 6	0	2	7	19	5	11						44
SEP 7-13	6		1	30	3	20						60
SEP 14-20			2	49	3	8	1					63
SEP 21-27			3	40	4	4	2					53
SEP 28-OCT 4			1	35	4	14	4					58
OCT 5-11	1		2	42	3	21						66
OCT 12-18				33		23	5					64
OCT 19-25				6		1		2	2	22	4	41
OCT 26-30			2		1	1				2*	2*	
TOTAL	9	41	36	257	23	121	12	2	1*	10*	8*	23
PERCENT OF TOTAL	1.6%	7.4%	6.5%	46.6%	4.1%	22.0%	2.2%	4%	5%	6.2%	2.5%	552

\* INDICATES FOUR HOUR MISSIONS

FIGURE 2

CHAPTER II

DEPLOYMENT AND ORGANIZATION

After the COMBAT BRONCO evaluation, which ended on 30 October 1968, the basic plan was to integrate and deploy the increasing OV-10 aircraft and FAC inventory throughout the 504th TASG network.<sup>1/</sup> After the initial airlift of six OV-10s to Southeast Asia, follow-on OV-10 aircraft were scheduled to be sealifted by carrier and offloaded at Cam Ranh Bay. The sealift schedule based on production data was:<sup>2/</sup>

	<u>1968</u>						<u>1969</u>					
<u>TO:</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>
SMAMA	10	10	10	10	10	10	11	20	20	15	--	--
SEA	0	0	10	10	10	10	10	10	11	20	20	15

Deployment and Distribution

Main Support Bases (MSB) designated for the OV-10 aircraft were: Bien Hoa AB, Da Nang AB, Nakhon Phanom AB and Phan Rang AB.<sup>3/</sup>

Distribution of OV-10 Aircraft<sup>4/</sup>

	<u>NAKHON PHANOM</u>	<u>BIEN HOA</u>	<u>DA NANG</u>	<u>PHAN RANG</u>	<u>TOTAL</u>
NOV 1968	2	16	--	3	21
DEC 1968	--	18	--	4	22
JAN 1969	1	32	--	4	37
FEB 1969	--	34	16	3	53
MAR 1969	1	36	8	4	49
APR 1969	4	43	15	4	66
MAY 1969	11	38	24	4	77



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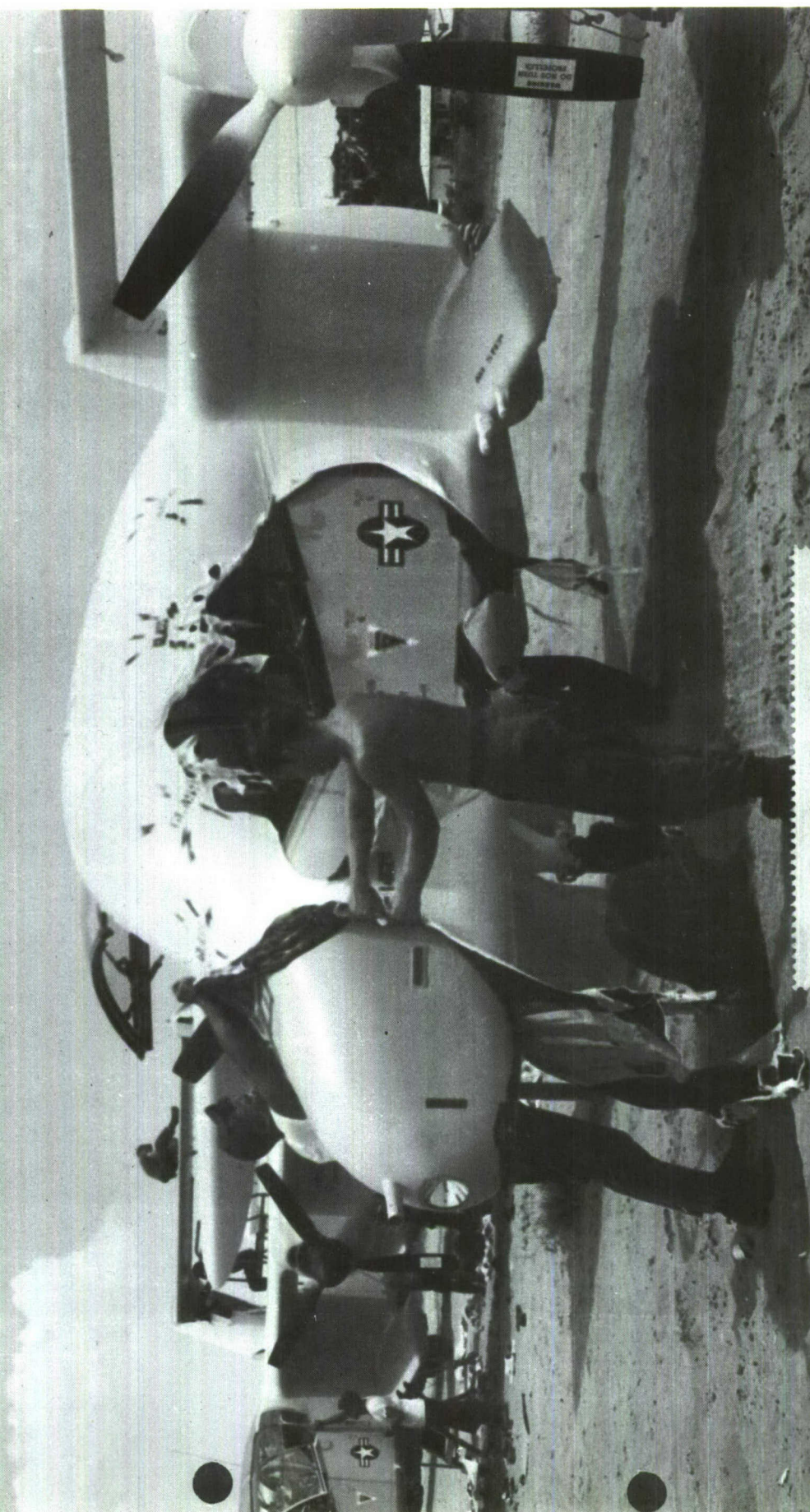
OV-10 Heading for SEA

FIGURE 3

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OV-10 "DE-COCOONING"  
at Cam Ranh Bay

FIGURE 4

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[REDACTED]

The 19th TASS, located at Bien Hoa AB, received the majority of inbound OV-10 aircraft. They were dispersed to the TACPs which supported the 1st Infantry Division, 25th Infantry Division, 199th Light Infantry Brigade, and the 1st Air Cavalry Division. The FOLs serving these U.S. Army units were located at Cu Chi, Di An, Lai Khe, Phuoc Vinh, Dau Tieng, Tay Ninh and Quon Loi.<sup>5/</sup> The 20th TASS at Da Nang utilized its OV-10 aircraft in support of the Americal Division and 1st Brigade of the 5th Infantry Division (Mechanized). FOLs for the 20th TASS were located at Quang Tri, Chu Lai and Pleiku.<sup>6/</sup> The 23d TASS at Nakhon Phanom AB had only one FOL located at Ubon AB. The Theater Indoctrination School operated its OV-10 aircraft from the Main Operating Base (MOB) at Phan Rang AB.<sup>7/</sup>

#### Out-Country Operations

The OV-10 aircraft used out-country came from the 20th TASS (Da Nang and Pleiku) and the 23d TASS (Nakhon Phanom and Ubon). Sorties were fraggged by STEEL TIGER Fragmentary Orders for full coverage of assigned VR sectors during the day and assigned route segments at night. Additional sorties were fraggged to support IGLOO WHITE, PRAIRIE FIRE, DANIEL BOONE, and special operations. Aircrews flew visual reconnaissance and strike control missions under the control of air and ground command/control centers.<sup>8/</sup>

#### OV-10 Out-Country Sorties<sup>9/</sup>

NOV 68 - 87	MAR 69 - 185
DEC 68 - 181	APR 69 - 204
JAN 69 - 199	MAY 69 - 234
FEB 69 - 173	

# OV-10 BASES OF DEPLOYMENT



FIGURE 5



OV-10 UNITS AND RELATED ORGANIZATIONS  
IN SOUTHEAST ASIA - JUNE 1969

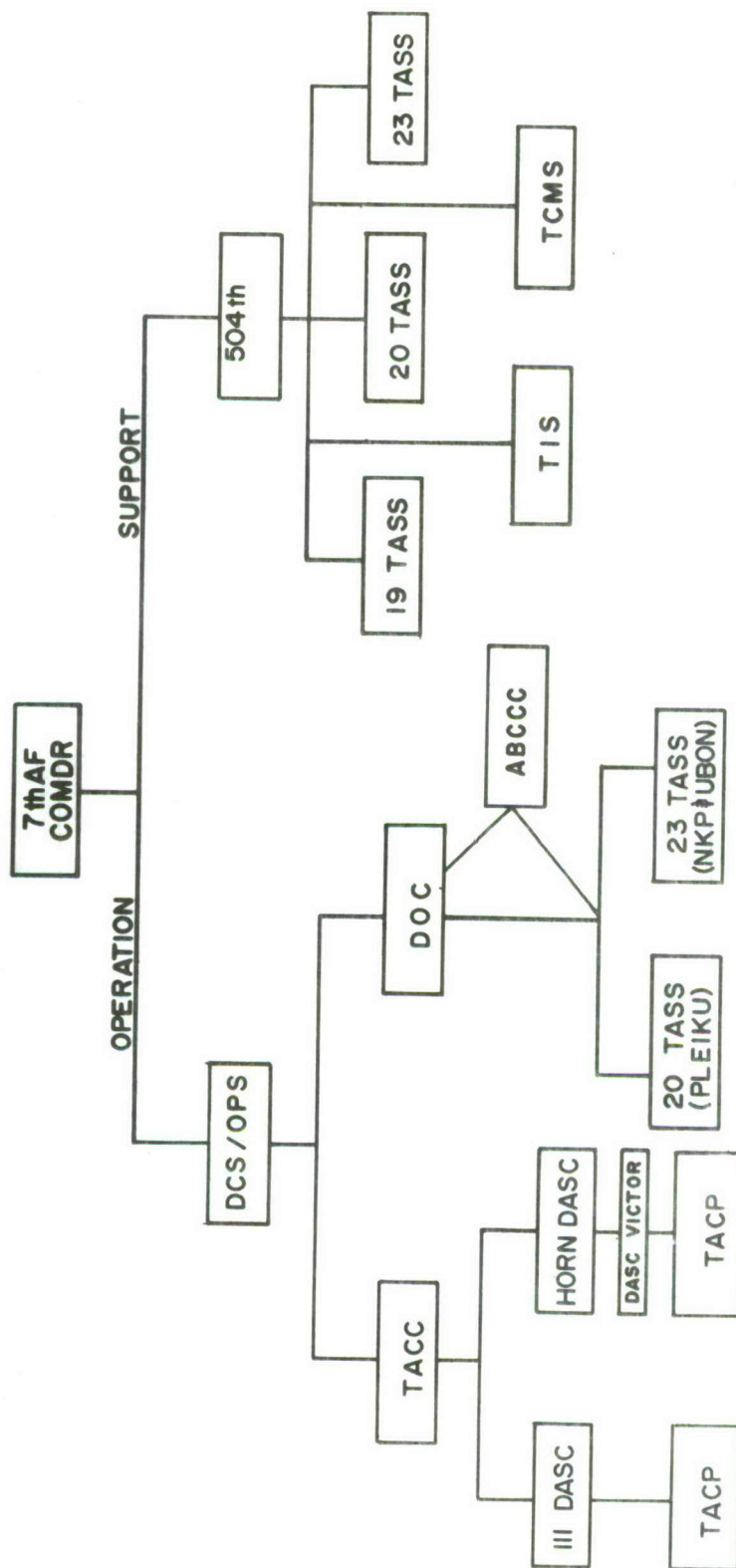


FIGURE 6

### In-Country Operations

The OV-10 in-country operations consisted primarily of close air support (CAS) sorties flown in support of U.S. Army units and visual reconnaissance. In addition, secondary missions included radio relay, convoy escort, air/ground coordination, artillery adjustment, and CS gas-expenditure control missions.<sup>10/</sup> Bronco units also scheduled ground alert aircraft and crews to counter night attacks on ground units, bases, and special forces camps.<sup>11/</sup>

The OV-10 aircraft inventory in SEA grew at a pace commensurate with orderly deployment plans. The following chart catalogues that inventory and provides a monthly breakdown of sorties and hours flown:<sup>12/</sup>

	<u>OV-10 Inventory</u>	<u>Sorties</u>	<u>Hours Flown</u>
NOV 68	21	641	1,543
DEC 68	28	1,230	2,478
JAN 69	37	1,757	3,783
FEB 69	53	1,850	3,384
MAR 69	49	2,581	5,117
APR 69	66	3,132	5,730
MAY 69	77	3,449	7,167

### Aircraft Damage and Losses

Considering the increasing number of hours flown, aircraft loss and damage rates were extremely low. During the same period as shown here, no OV-10s were damaged or lost on any out-country operations; in-country, one

[REDACTED]

OV-10 received battle damage and one was lost. Two OV-10s were damaged and three were lost due to operational accidents.<sup>13/</sup>

#### OV-10 Aircrew Manning

PACAF OV-10 pilot training requirements were estimated at approximately 262 per year. This total included TASS commanders, operations officers, forward air controllers, and instructors for the 504th TASG Theater Indoc-trination School. In addition to Tactical Air Command's programmed OV-10 pilot production, O-1 pilots in SEA were upgraded into OV-10s as their aircraft were replaced.<sup>14/</sup> The monthly SEA manning/readiness picture is shown below:<sup>15/</sup>

	<u>FORMED</u>	<u>COMBAT READY</u>	<u>% CR</u>
NOV 68	63	39	61.9
DEC 68	73	53	72.6
JAN 69	87	61	70.1
FEB 69	100	76	76.0
MAR 69	103	82	79.6
APR 69	113	95	84.1
MAY 69	127	117	92.1

#### OV-10 Aircrew Training

All OV-10 FACs assigned to SEA had received training at the TAC Central FAC Training School at Hurlburt Field, Fla. This initial training in proficiency flying, map reading, basic tactics, night tactics, and ground TACS instruction was qualitatively supplemented by the 504th TASG TIS at Phan Rang AB.<sup>16/</sup> All OV-10 instructors at the TIS had combat experience from FAC



[REDACTED]

assignments in SEA. <sup>17/</sup> These five courses were offered at TIS for OV-10  
pilots: <sup>18/</sup>

<u>COURSE</u>	<u>TYPE</u>	<u>FLYING HOURS</u>
OV-10 Short (OV-105):	For those pilots who have completed the OV-10 course at Hurlburt.	7 1/2
OV-10 Long (OV-10L):	For those pilots who have not previously flown the OV-10 aircraft (does not include combat ready SEA FACs).	18
OV-10 Conversion (OV-10C)	For those pilots who are combat ready SEA FACs, but have not previously flown the OV-10 aircraft.	12
OV-10 Staff (OV-10ST)	For those staff officers who have not previously flown the OV-10 aircraft and will fly non-FAC missions.	12
OV-10 Instructor Pilot (OV-10IP)	For qualified SEA FACs who have flown the OV-10 aircraft and are upgrading to instructor pilot status.	6 1/2

Since the 504th TASG TIS could not provide the necessary Phase II Combat Readiness Training, it was essential that each Tactical Air Support Squadron conduct all Phase II Training. In addition, the 20th and 23d TASS conducted specialized Phase II Training to insure that all aspects of out-country missions were covered. <sup>19/</sup>

[REDACTED]

## CHAPTER III

### THE ARMED OV-10 FAC

#### Background

The OV-10 aircraft seemed ideal to accomplish an armed FAC role, with its four forward-firing M-60 (7.62-mm) machine guns and five armament stations capable of carrying 3,600 pounds of additional ordnance.<sup>1/</sup> In April 1969, an exercise called MISTY BRONCO was initiated to evaluate the use of OV-10 FAC aircraft in providing a limited but highly responsive airstrike capability to support U.S. Army forces requesting immediate close air support and to use against FAC-acquired targets until heavier fire support could respond.<sup>2/</sup> The evaluation was conducted with the TACP supporting the 2d Brigade of the 25th Infantry Division (located at Cu Chi), under the operational control of 7AF TACC through the Director, III DASC. Ordnance was limited to 2,000 rounds of 7.62-mm and High Explosive (HE) rockets.<sup>3/</sup>

For the MISTY BRONCO evaluation, two standard munitions configurations were authorized:<sup>4/</sup>

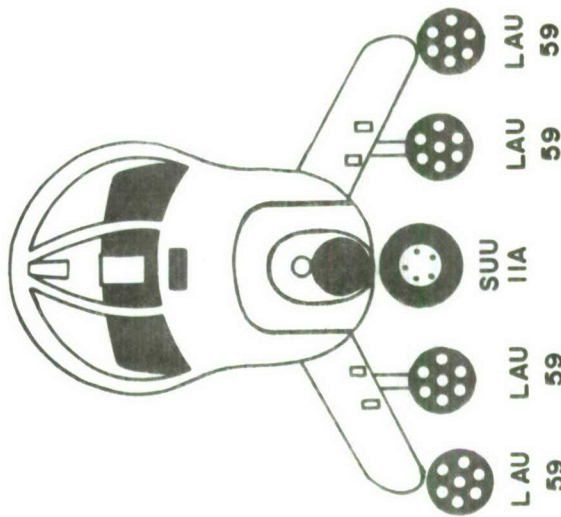
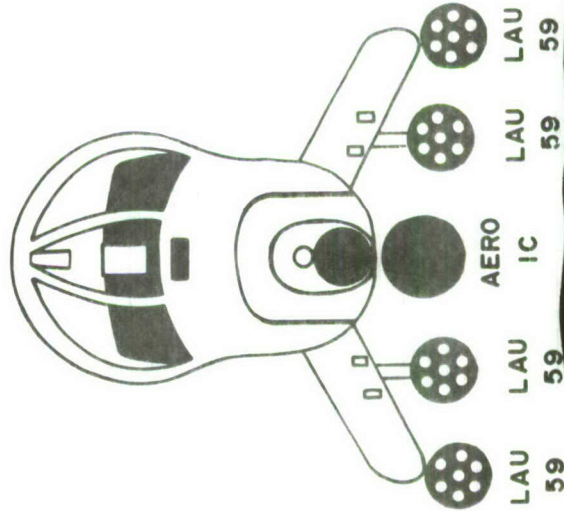
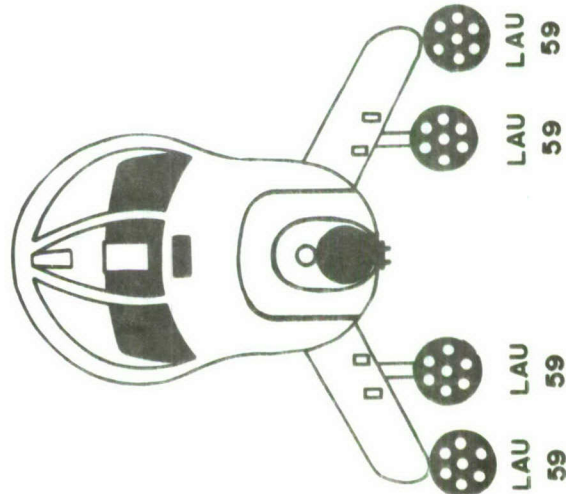
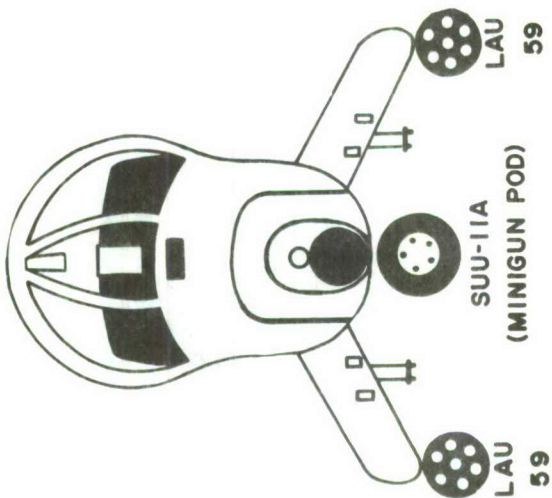
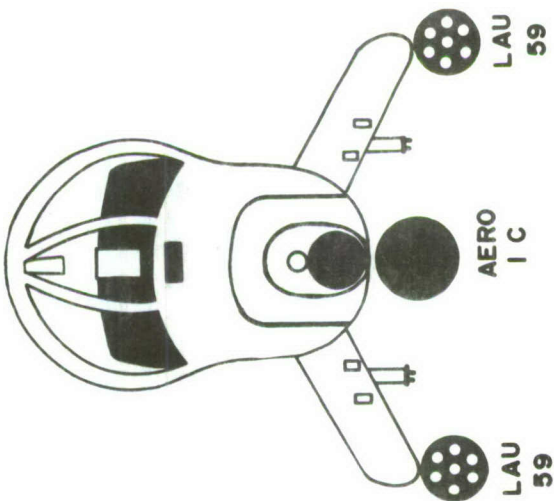
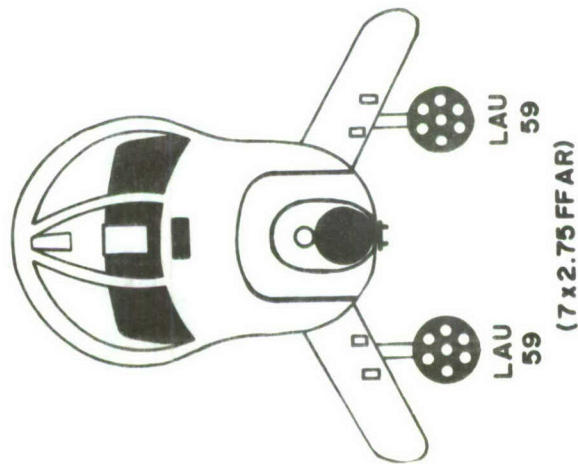
#### Day Configuration

- 2,000 rounds 7.62-mm
- 2 LAU-59A (White Phosphorous rockets) on stations 2 and 4.
- 2 LAU-59A (High Explosive rockets) on stations 1 and 5.

#### Night Configuration

- 2,000 round 7.62-mm.
- 2 LAU-59A (White Phosphorous rockets) on stations 2 and 4.
- 1 LAU-59A (High Explosive rockets) on station 5.
- 1 B-37K Flare Rack with 4MK-24 flares on station 1.

# COMBAT BRONCO-"DAY" ORDNANCE CONFIGURATIONS



NOTE: ALL CONFIGURATIONS INCLUDE  
FOUR M-60 MACHINE GUNS WITH  
2000 ROUNDS.

FIGURE 7



# COMBAT BRONCO-"DAY" ORDNANCE CONFIGURATIONS

NOTE: ALL CONFIGURATIONS INCLUDE  
FOUR M-60 MACHINE GUNS WITH  
2000 ROUNDS.

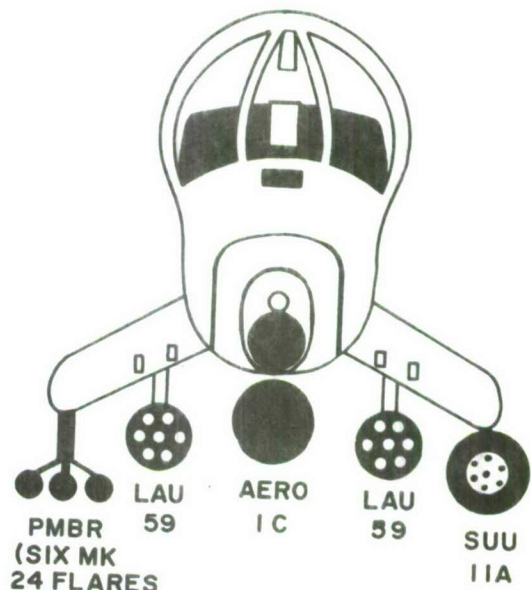
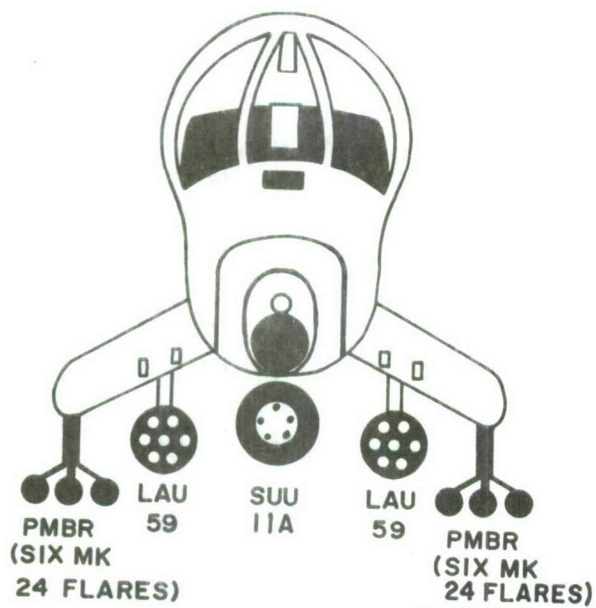
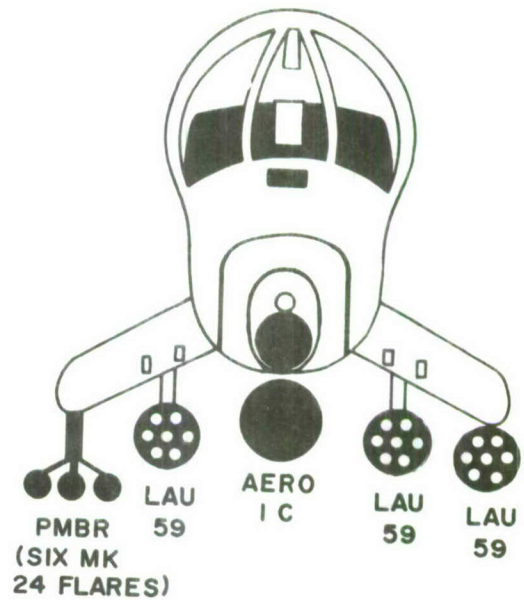
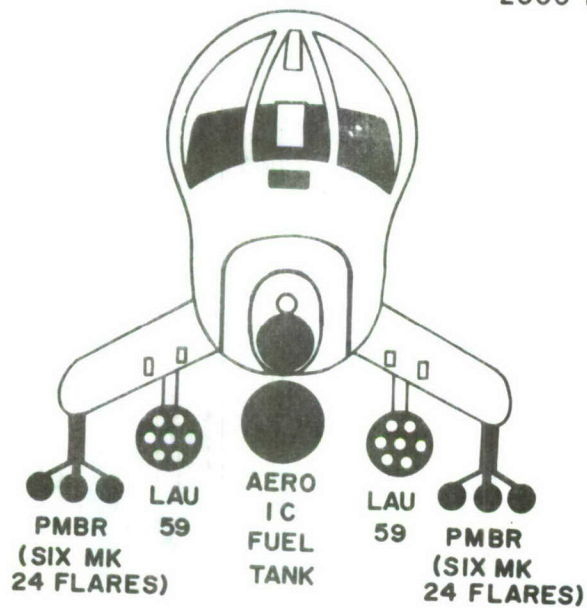


FIGURE 8

COMBAT BRONCO "NIGHT" ORDNANCE CONFIGURATIONS

NOTE: ALL CONFIGURATIONS INCLUDE  
FOUR M-60 MACHINE GUNS WITH  
2000 ROUNDS.

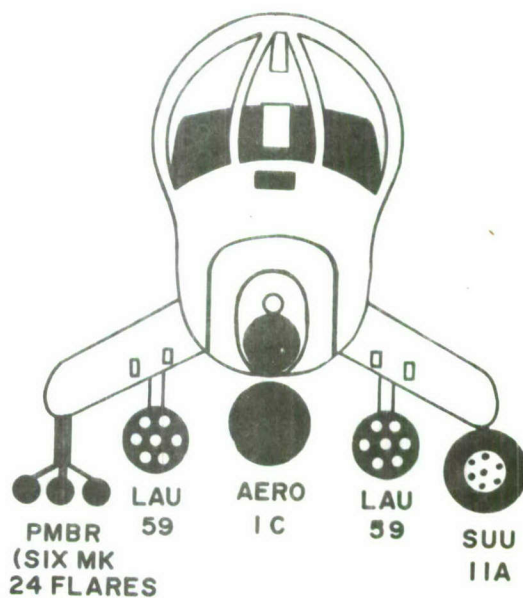
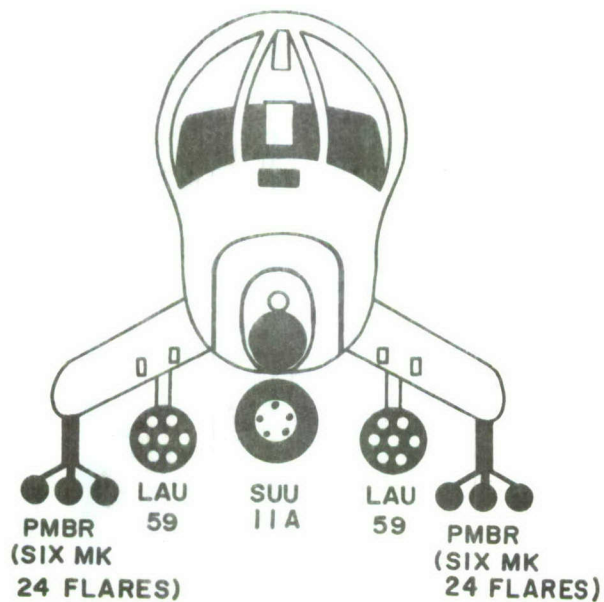
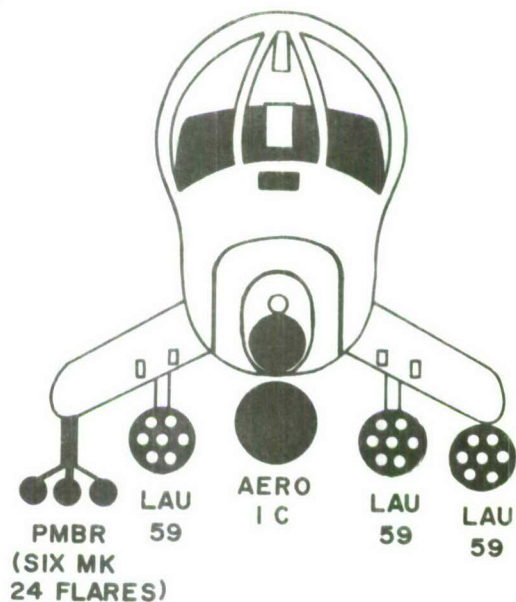
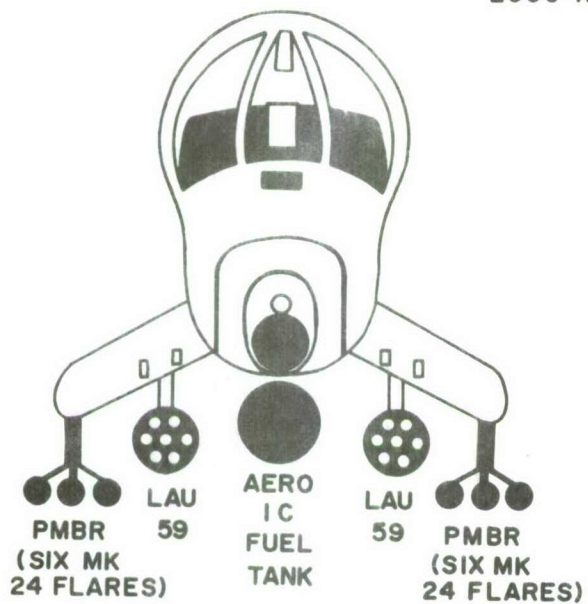


FIGURE 9

[REDACTED]

The High Explosive rockets were loaded on stations 1 and 5 to facilitate visual checks from the cockpit for hung HE ordnance. A one-in-five tracer to ball ammunition was used to aid the pilot in observing his fire. The day sorties involved the conventional FAC missions: Visual Reconnaissance and/or preplanned FAC missions to conduct airstrikes or to CAP ground operations. No armed night sorties were scheduled but an alert capability was maintained for emergency Troops-in-Contact (TIC) situations. During the period of the evaluation, an armed FAC was scrambled a total of seven times.<sup>5/</sup>

Sorties Flown, Munitions Expended, Ground Fire Occurrences

	<u>Sorties Flown</u>	<u>Munitions Exp</u>	<u>Ground Fire</u>		
		<u>HE Rkts</u>	<u>7.62-mm</u>	<u>Received</u>	<u>Acft Hits</u>
Armed FAC	508	1,171	84,105	11	2
Training	23	521	37,375	0	0
Total	531	1,692	121,480	11	2

There were numerous support opportunities in the daily operational summary reports which demonstrated the effectiveness and value of the armed FAC concept.<sup>6/</sup> Excerpts from three summaries illustrate the point:

*"(26 April) During the course of a normal preplanned strike at XT550290, VC began to scatter from bunkers in the target area. The FAC requested immediate TAC Air at 1430 after completion of his preplanned strike. From 1430 until 1505 the FAC contained the enemy until BOXER 01 (2 F-4s) flight arrived on station. The FAC expended 14 HE rockets and 1975 rounds of 7.62-mm and was credited with 2 KBA, 1 secondary explosion and 1 secondary fire. TAC Air accounted for an additional 3 KBA and 6 secondary explosions."*

\*\*\*\*\*



[REDACTED]

"(5 May) Issue 25, on a CAP for ground forces, saw two VC run into a military structure at XT4999272. The ground commander requested the FAC to expend at 1530. Strike clearance was received through the Division TACP at 1540. Issue 25 was on target at 1545, off at 1555, expending 14 HE rockets. Ground fire was received but no aircraft hits were sustained. Issue 25 was credited with one military structure destroyed, two secondary fires, and two VC KBA by body count."

\*\*\*\*\*

"(22 May) An Army Long Range Reconnaissance Patrol / LRRP was receiving sniper fire and pinned down at XT545328. They requested air support at 1830. Issue 25, on a VR mission, was nearby and requested strike clearance immediately. He was able to pinpoint the LRRPs position and was on target immediately upon receiving strike clearance at 1835. Issue 25 expended 14 HE rockets and 1200 rounds 7.62-mm and was off target at 1850. No BDA was available, however the sniper fire terminated and the LRRP team was able to withdraw. TAC Air was not required."

The basic cause for the delay between recognition of the requirement for an armed FAC aircraft and its implementation was the amount of time necessary to plan, test, introduce, evaluate and integrate the new aircraft. <sup>7/</sup>

The MISTY BRONCO evaluation, however, demonstrated the effectiveness of the Armed FAC concept in reducing response time for Air Force strike support to Army immediate requests. As a result, the FAC also effectively attacked highly perishable targets. In many cases, the FAC's fire power was sufficient to destroy the target. <sup>8/</sup>

[REDACTED]

Subsequently, the Commander, Seventh Air Force, directed that all OV-10 FAC aircraft assigned for in-country operations be armed. Initial armament was limited to the addition of 2.75" HE rockets. It was anticipated that when sufficient munitions personnel and materiel support were made available, the M-60 machine guns would be utilized. The OV-10 aircraft, which were used for the MISTY BRONCO evaluation, were authorized to continue using their M-60 machine guns.<sup>9/</sup>

Arming the OV-10 aircraft did not change the basic FAC mission, i.e., strike control, VR, artillery adjustment, convoy escort, etc. The use of armament supplemented this mission by providing the FAC with a limited but highly responsive airstrike capability. It was to be used in support of friendly troops in contact when TAC Air was not available and against FAC-acquired targets requiring immediate strike response.



[REDACTED]

## CHAPTER IV

### CONCLUSIONS AND RECOMMENDATIONS


In 1966, a study by Seventh Air Force operations analysts proposed a list of desirable characteristics for future FAC aircraft:<sup>1/</sup>

- . Armor plating.
- . Capable of climbing at a rate of more than 1,000 FPM.
- . Capable of 250-300 knots.
- . Maximum endurance of four hours.
- . Highly maneuverable.
- . Capable of carrying a pilot, an observer, and 200 pounds of cargo.
- . Can operate on short fields and unimproved sod runways.
- . Increased instrumentation for IFR flight including TACAN, tunable radio sets and 2 FM sets.
- . Two turboprop engines with single engine capability.
- . Limited armament.
- . Self-sealing fuel tanks.

At that time, the O-1 aircraft was admittedly obsolete; the O-2 was procured to serve as an interim FAC aircraft.<sup>2/</sup>

The OV-10 was planned, from its inception, as a "mid-spec" aircraft with the necessary capabilities built into it to satisfy SEA FAC requirements.<sup>3/</sup> Its advantages fulfilled the original required operational capabilities, and more:<sup>4/</sup>

- . Armor plating - 328 pounds of armor plating located in back of the seats and along the bottom of the aircraft.
- . High dive and zoom capability--can dive at 400 knots; distinct advantage in standoff marking of heavily defended targets.
- . Rapid speed point to point--cruises 150-180 knots.
- . Two place, tandem cockpit with zero-zero ejection capability.
- . Cargo bay with approximately 3,000-pound loading capacity.
- . Tricycle landing gear designed for operation from rough terrain.
- . Night and all-weather instrumentation, including TACAN, tunable radios and two FM sets.

- 
- . Two turboprop engines with single engine capability.
  - . Armament--four M-60 machine guns with five armament stations capable of carrying 3,600 pounds of ordnance. Can expend HE rockets, napalm, and CBU.
  - . Self-sealing fuel tanks (internal).
  - . Multiple target-marking capability; can carry more rockets and flares than other FAC aircraft.
  - . Increased visibility.
  - . High altitude rendezvous capability.
  - . Effective smoke-generating capability.
  - . Engine noise less than O-2 aircraft.
  - . Center line station can carry a 150 or 230 gallon fuel tank.
  - . Limited but adequate capability to drop paratroops or serve in med-evac role.

There were only a few disadvantages. They were: <sup>5/</sup>

Rear Cockpit Instrumentation. Lack of a reliable attitude gyro and absence of any directional instrument in the rear cockpit could contribute to spacial disorientation on the part of observers during night operations. In addition, more instruments would permit an instructor pilot to more efficiently monitor front cockpit activities during training.

Placement of Front Cockpit Intercom Panel. The location of the intercommunication set was on the right side of the front cockpit. Under combat conditions, the OV-10 FACs had to switch radio sets frequently and rapidly while controlling the aircraft. Communications adjustments by the pilots had to be made by releasing the flight control stick or changing hands.

Limited Starlight Scope Capability. Tests conducted in the field by 20th TASS and 23d TASS indicated that visibility was limited when they used the Starlight Scope in the rear cockpit. The propellers also caused some distortion, and canopy glare from the front cockpit occasionally hampered operations.



[REDACTED]

Poor Aircrew Cockpit Environment. High cockpit temperatures caused excessive discomfort to pilots and observers during ground operations and at lower altitudes during sustained flights. Deficiencies in the ventilation/cooling system in the OV-10 are of such magnitude that during hot summer months in SEA, operational capability may be affected and safety of flight jeopardized due to dehydration problems with OV-10A crewmembers. This refers to in-country FACs in support of U.S. ground troops, since they generally remain at an average altitude of 1,500 feet. Temperatures at that altitude are usually comparable to ground temperature and humidity. Cockpit cooling was limited to only several ram air inlets, which did not offset effects from high ambient temperatures and direct sunlight upon the greenhouse-like canopy. U.S. Marines flying OV-10s out of Marble Mountain and Quang-Tri North in 1968-1969 found it necessary to restrict sortie length to two and one-half hours to prevent excessive dehydration and fatigue during the summer. U.S. Air Force FACs flew shorter sorties during summer months than normal, which degraded low-altitude VR time between airstrikes. Crewmembers found it necessary to carry sizable amounts of drinking water (one to two Army canteens) to offset body fluid loss.

Another disadvantage, cockpit noise levels as high as 125 db were recorded, and some pilots indicated subjective temporary hearing loss at post flight.

These discrepancies were the most frequently reported from OV-10 units and were major obstacles to its full effectiveness as a Southeast Asia FAC aircraft.



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OV-10 Front Cockpit  
Instrumentation  
FIGURE 10



## Recommendations

Several recommendations obtained from the field are presented here for consideration:

- . Improved instrumentation in the rear cockpit would alleviate associated problems with disorientation and instructor pilot activities. In addition, the front seat pilot could operate the Starlight Scope with considerably better visibility.
- . An environmental control unit should be installed to counteract high cockpit temperatures. It is also recommended that some type of canopy shielding be accomplished for a few aircraft to determine the decrease in thermal stress.
- . Starlight Scope limitations have prompted several recommendations: (1) install a curtain between the front and rear cockpits to diminish canopy glare; (2) improve front cockpit instrument lighting so that primary engine and flight instruments can be seen without causing undue canopy glare; (3) install a Starlight Scope mount similar to a periscope sextant mount in some aircraft; (4) remove part of the plexiglass canopy in the rear cockpit and install a wind deflector. This would eliminate part of the canopy glare and distortion problem and aid crew comfort; and (5) test Starlight Scope operation feasibility facing rearward through the cargo bay doorway.
- . Install a floor MTC switch in each cockpit.
- . Install an internal self-sealing fuel tank for the cargo compartment to eliminate external fuel tanks.
- . Activate the oxygen system to improve night vision. The oxygen mask would also help eliminate high cockpit noise.
- . Install a removable rear cockpit control stick to facilitate handheld Starlight Scope operations.
- . Install X-Band beacons for easier rendezvous, especially at night.
- . Incorporate shields for external lights to prevent observation from the ground.
- . Install aircraft-mounted strike cameras (such as the KB-18).
- . Install laser target designators.

**SECRET**

Conclusion

Incorporation of the OV-10 aircraft into the TACS has been accomplished relatively problem-free. Because of careful planning and foresight, there was a minimum of delay and confusion. Deployment, especially, was accomplished smoothly because commanders made certain the necessary maintenance and personnel support was available.

Enhancing the close air support mission, the OV-10 aircraft has proved itself a superior FAC vehicle. Its performance and capabilities have impressed the FACs and U.S. Army units it supports.

**SECRET**



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## GLOSSARY

Acft	Aircraft
AFLC	Air Force Logistics Command
AFSC	Air Force Systems Command
AGL	Above Ground Level
BDA	Bomb Damage Assessment
CAP	Combat Air Patrol
CAS	Close Air Support
CB	COMBAT BRONCO
CBU	Cluster Bomb Unit
CONUS	Continental United States
CR	Combat Ready
CTZ	Corps Tactical Zone
DME	Distance Measuring Equipment
e.g.	For Example
FAC	Forward Air Controller
FM	Frequency Modulation
FOL	Forward Operating Location
FPM	Feet Per Minute
HE	High Explosive
IAW	In Accordance With
i.e.	That Is
IFR	Instrument Flight Rules
KBA	Killed-by-Air
LRRP	Long Range Reconnaissance Patrol
Med-Evac	Medical Evacuation
MSB	Main Support Base
PCS	Permanent Change of Station
Rkt	Rocket
RVN	Republic of Vietnam
SEA	Southeast Asia
SMAMA	Sacramento Air Materiel Area

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TAC	Tactical Air Command
TACAN	Tactical Air Navigation
TACP	Tactical Air Control Party
TACS	Tactical Air Control System
TASG	Tactical Air Support Group
TASGR	Tactical Air Support Group Regulation
TASS	Tactical Air Support System
TDY	Temporary Duty
TIS	Theater Indoctrination School
VC	Viet Cong
VR	Visual Reconnaissance